



Introduction

In accordance with Ordinance 55661, enacted by the Board of Aldermen on July 6, 1970, the City Plan Commission is privileged to submit a current progress report on Operation Breakthrough in St. Louis.

The approval of the program by the Board of Aldermen has propelled St. Louis into the forefront of the industrialized housing concept.

Operation Breakthrough, a promising experiment aimed at meeting the critical shortage of housing, is believed to be one of the most imaginative programs related to home construction ever initiated by the Federal Government.

Mr. Alfred Perry, Federal Director of Operation Breakthrough, has expressed his appreciation "for the splendid cooperation offered by the City of St. Louis to the Department of Housing and Urban Development and its prototype site developer in the development of St. Louis' breakthrough site. Of the nine Operation Breakthrough sites nation-wide, the St. Louis Breakthrough site construction progress is led only by the Kalamazoo, Michigan, prototype site which has a much smaller number of units and does not employ the heavy construction methods needed for the St. Louis site." Mr. Perry "attributes much of the outstanding progress and success of this site to the City's cooperation and assistance."

In this report, a phase by phase over-view of program progress to date will be presented with special attention given to points on which the members of the Board of Aldermen specifically has requested information.

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Aldermen View Construction Progress at "Operation Breakthrough" Site

Background to the National Program

Early in May of 1969, George Romney, Secretary of the Department of Housing and Urban Development (HUD), made an announcement, in conference with governors, mayors, leaders of industry, labor and the design professions, of the Operation Breakthrough Program.

Whereas Federal money has often been invested in research and technology, the Federal Government has not in the past encouraged extensive research in the housing industry. Secretary Romney's announcement, initiating Operation Breakthrough, presents an opportunity to accelerate progress in the development of housing for people of all backgrounds and income ranges.

Operation Breakthrough activities were generated by the findings of published reports by three national committees: The National Commission on Urban Problems or the Douglas Commission; the Committee of Urban Housing or the Kaiser Commission; and the Departments of Commerce, Housing and Urban Development Panel on Housing Technology. Within the last three years, all three of these committees have recommended greater governmental involvement in the housing field.

A minimum of \$100 million per year was recommended for research in the field of housing technology. This type of research is necessary if the nation is to fulfill our housing needs, projected at over 26 million

Background to the Saint Louis Program

After the May 1969 announcement, proposals were solicited (1) from state and local governments for prototype sites, and (2) from housing systems producers, site planners and site developers in order to produce various prototype model communities.

Mayor A.J. Cervantes requested that the City Plan Commission select potential sites and prepare an application to be submitted by the City of St. Louis for inclusion in the Operation Breakthrough program. There were 218 sites, spread across the nation, entered into the national competition. In addition, 236 complete housing systems were submitted, and 82 site planners submitted proposals.

The St. Louis Application made a strong case and, after detailed analysis by HUD, St. Louis was selected as one of eight cities where prototype homes were to be demonstrated. Subsequently, HUD selected 22 housing systems and four of these were assigned for demonstration in St. Louis.

Each of the selected cities was asked to pass enabling legislation which would allow the unconstrained construction of Operation Breakthrough units on the designated sites. In July of 1970 -- recognizing that

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Breakthrough had a most promising potential for the people of our city -- the Board of Aldermen in St. Louis passed the necessary legislation (Ordinance #55661) -- authorizing the St. Louis Operation Breakthrough home demonstration in St. Louis.

Variety in the "Operation Breakthrough" Experiment

In selecting sites, HUD was particularly interested in variety so that all types of housing systems and a diversity of site plans could be tested. As a result, not only are the building types varied, but the entire approach to site design is also totally different from one city to another. Building systems include wood, metal, fiberglass plastics, concrete and brick and are being used in modular, panel and service core units. On some suburban sites, housing is being developed at a low density around open space and lakes. On the other hand, urban sites are being developed with town houses, stacked town houses, garden apartments and medium rise structures. Thus the total of all sites results in examples of most combinations of building types and densities. On no one site was it feasible to demonstrate all the types of units or all land use configurations that make up the Operation Breakthrough experiment.

The St. Louis Site for Breakthrough

The St. Louis site selected for Operation Breakthrough is actually divided into two sites just to the east and to the west of Laclede Town. The size of these two sites together is approximately 15 acres. The west site is located on the west side of Compton Avenue between Laclede Avenue and Olive Street, and consists of 7.9 acres. The east site is located on the east side of Ewing, between the present Heritage House development and Market Street, and consists of 7.6 acres.

Two hundred and twenty-three units are being built on the west site and 241 on the east site.

The two sites were originally acquired by the St. Louis Land Clearance for Redevelopment Authority as a part of the Mill Creek Urban Renewal project. The east site was subsequently acquired by Millstone Construction Company which also held the west site under option from the Land Clearance Authority. The land cost of the two sites was approximately \$400 thousand dollars. Title to both sites now rests with the newly formed University Heights Breakthrough Redevelopment Corporation who have financial responsibility for the development.

The Participants

The housing systems selected for construction in St. Louis were submitted by Rouse-Wates, Inc., of Columbia, Maryland; Descon-Concordia Systems, Ltd.

THE HISTORY OF THE COUNTY OF MIDDLESEX

The first part of the history of the County of Middlesex is the history of the town of London. The town of London is the largest town in the County of Middlesex, and is the capital of the Kingdom of Great Britain. The town of London is situated on the River Thames, and is bounded by the River Thames on the south, and by the River Tyne on the north. The town of London is the largest town in the County of Middlesex, and is the capital of the Kingdom of Great Britain. The town of London is situated on the River Thames, and is bounded by the River Thames on the south, and by the River Tyne on the north.

The second part of the history of the County of Middlesex is the history of the town of Westminster. The town of Westminster is the second largest town in the County of Middlesex, and is the seat of the British Government. The town of Westminster is situated on the River Thames, and is bounded by the River Thames on the south, and by the River Tyne on the north.

The third part of the history of the County of Middlesex is the history of the town of Epsom. The town of Epsom is the third largest town in the County of Middlesex, and is the seat of the Epsom Racecourse. The town of Epsom is situated on the River Thames, and is bounded by the River Thames on the south, and by the River Tyne on the north. The town of Epsom is the third largest town in the County of Middlesex, and is the seat of the Epsom Racecourse. The town of Epsom is situated on the River Thames, and is bounded by the River Thames on the south, and by the River Tyne on the north.

The fourth part of the history of the County of Middlesex is the history of the town of Richmond. The town of Richmond is the fourth largest town in the County of Middlesex, and is the seat of the Richmond Racecourse. The town of Richmond is situated on the River Thames, and is bounded by the River Thames on the south, and by the River Tyne on the north.

of Montreal, Quebec; Material Systems Corporation of Valley Center, California; and Home Building Corporation of Sedalia, Missouri. Each will be responsible for erection of their respective structures.

In addition to the four prime builders, the following private concerns are also involved in the project:

University Heights Breakthrough Redevelopment Corporation, a corporation formed under the Missouri Redevelopment Corporations Act as a Special Purpose Organization holds title to the real estate, and has financial responsibility for the development.

Millstone Construction, Inc., and Millstone Associates, Inc., as a joint venture, is the site developer with overall supervisory responsibility including cost analysis, timing and coordination.

Hellmuth, Obata & Kassabaum, St. Louis architects, have been the site planners with responsibility for the overall design concept including unit placement, parking space, street, and sidewalk and utility line layouts and landscaping.

The Site Plan

The St. Louis sites, being limited in acreage and urban in character, were naturally chosen by HUD to demonstrate medium density configurations. The density will be approximately the same as that developed in the adjacent Laclede Town complex.

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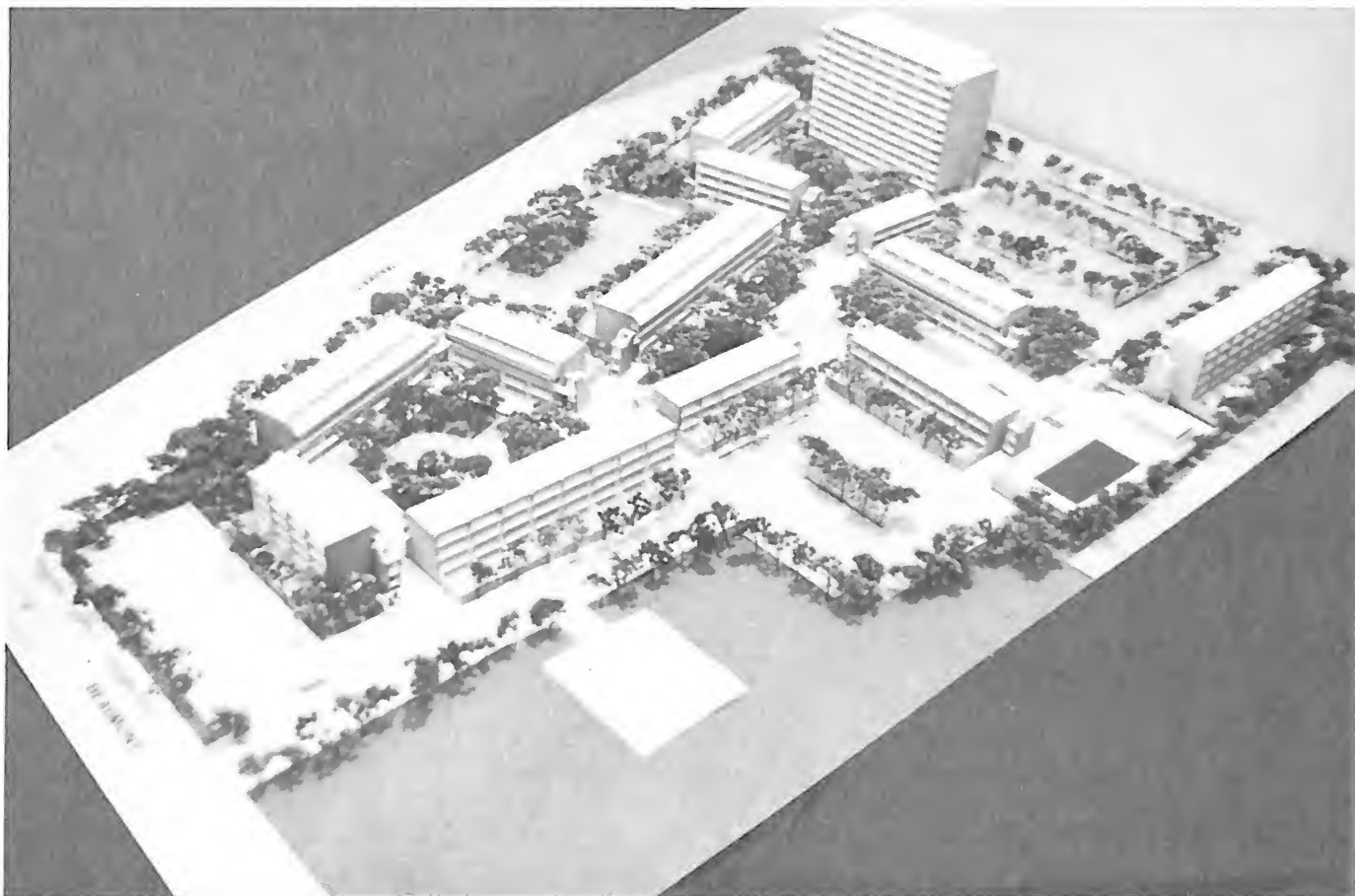
The final site plan follows the general concepts shown in the preliminary designs presented by the site planners in 1970. The site planners have arranged the buildings on the site to face inward toward a pedestrian street which is developed with a series of connected courtyards.

Vehicular traffic and parking will be on the periphery of each site with no vehicular traffic entering the pedestrian street. Automobile traffic is completely separated from interior pedestrian movements.

Within the pedestrian street a wide variety of community facilities are to be located: here there will be play areas for children of all ages, sitting areas, water fountains, paved areas for cycling, small amphitheaters for special events, wisteria covered arbors and numerous shade trees. Each of the sites will have a swimming pool, wading pool and bath house. Thus, a full complement of open spaces and recreational facilities to meet the needs of residents is incorporated within the sites.

A wide range of dwelling types are being developed on the St. Louis site including attached town houses, two story garden apartments, stacked town houses three and four stories in height, and two medium rise apartment buildings containing apartments for adults. These building types have been arranged on the site into a harmonious and attractive total composition. Both views and privacy for every unit have been taken into account.

VIEWS OF THE EAST OPERATION BREAKTHROUGH SITE





VIEWS OF THE WEST OPERATION BREAKTHROUGH SITE



The site plan was subjected to and benefitted from a review by top national experts of the American Institute of Architects, the American Society of Landscape Architects, the American Institute of Planners, and the American Society of Civil Engineers.

The Buildings and Number of Dwelling Units

In response to the request of the Housing and Urban Development Committee of the Board of Aldermen, the number of four bedroom units has been increased by HUD to 44 units. In addition, there will be constructed 66 three bedroom units, 209 two bedroom units, 82 one bedroom units and 63 efficiencies. Please refer to the table on the following page for a more detailed schedule of building type and unit size distribution.

On the east site, Rouse-Wates, Inc., will be the only builder. Relying on precast concrete wall and slab construction, Rouse-Wates is building one 12 story residential building containing 84 units, 11 three and four story buildings with a total of 130 units, and one six story building with 27 units -- a total of 241 units. Of these 241 units, 46 will be efficiencies, 27 one bedroom units, 123 two bedroom units, and 45 three bedroom units.

The other three builders will construct on the west site. Home Building Corporation will build 75 two and three story town houses of factory-built wood modules resulting in structures similar in exterior appearance to the present homes in Laclede Town. Of these 75 units, 10 will be two bedroom, 21 three bedroom, and 44 four bedroom units.

Saint Louis Operation Breakthrough

BUILDING TYPE AND UNIT SIZE DISTRIBUTION

(Construction Plans as of September 1971)

<u>Bldg. Type</u>	<u>No. of Stories</u>	<u>Eff. Units</u>	<u>1 BR Units</u>	<u>2 BR Units</u>	<u>3 BR Units</u>	<u>4 BR Units</u>	<u>Total Units</u>
DESCON/CONCORDIA (West Site):							
1 Elevator Apt.	10	5	45	40			
1 Low-rise	5	12	0	12			
1 Low-rise	3	0	0	14			
		<u>17</u>	<u>45</u>	<u>66</u>	-	-	128

MATERIAL SYSTEMS (West Site):

1 Garden Apt.	2		6	6			
1 Garden Apt.	2		4	4			
		-	<u>10</u>	<u>10</u>	-	-	20

HOME BUILDING (West Site):

75 Town Houses	2&3			10	21	44	
		-	-	<u>10</u>	<u>21</u>	<u>44</u>	75

ROUSE-WATES (East Site):

1 Elevator Apt.	12	20	20	40	4		
11 Low-rise	3&4	17	7	65	41		
1 Elevator Apt.	6	9	0	18	0		
		<u>46</u>	<u>27</u>	<u>123</u>	<u>45</u>	-	241

SUMMARY OF ALL UNITS

Number of Units	63	82	209	66	44	464
Percent Distribution	(13%)	(18%)	(45%)	(14%)	(10%)	(100%)

WEST SITE TOTAL UNITS	223
EAST SITE TOTAL UNITS	241
TOTAL UNITS	464

Material Systems, Inc., will use prefabricated molded panels made of fiber-reinforced resins to be assembled as garden apartments. Of these 20 units, 10 will be one bedroom units and 10 two bedroom units.

Descon-Concordia Systems, Ltd., of Montreal, Quebec, will build one 90 unit 10 story apartment, one five story 24 unit building and one three story building containing 14 units. Descon-Concordia will contract with local sources to manufacture and assemble the primarily pre-cast concrete structures. Seventeen efficiency units, 45 one bedroom units and 66 two bedroom units will be built.

Diversity in Rents

As outlined in the hearings before the Board of Aldermen, the income ranges for occupants of the Operation Breakthrough area will be diverse. The commitment to achieve a wide mix of tenants from all socio-economic backgrounds, has been a key in establishing rent schedules. During the initial two year contract phase completed units will be rented, leased, or on display. HUD is examining various legal mechanisms which would allow some of the units to be purchased by tenants following the contract phase.

Ten percent of the Breakthrough homes will be offered at low rents utilizing the HUD rent supplement programs, resulting in rentals from

\$75 to \$125 per month. Thirty percent of the units will be offered at moderate rents utilizing the regular Section 236 FHA financing program which will result in rental ranges from \$106 per month to \$178 per month. Fifty percent of the units will be offered at middle rents utilizing the Section 236 exception program with rental ranges from \$115 per month to \$190 per month. The remaining 10% of the units will be at normal market rate with rentals ranging from \$177 per month to \$287 per month. Rent at all income levels includes all utilities, range, refrigerator, exhaust fan, trash compactor, garbage disposal and air conditioning. Please refer to the table on the following page for a more detailed schedule of tentative rents.

The Department of Housing and Urban Development is in the process of issuing guidelines for tenant selection procedures which will provide the basis for local operations.

Construction Progress

Working through problems of money cutbacks, delays from inclement weather in the early spring of 1971, and technical refinements in some of the selected building systems, the St. Louis Operation Breakthrough program is now making rapid progress on the site.

Saint Louis Operation Breakthrough

SCHEDULE OF RENTS*

Rents indicated include all utilities, range, refrigerator, exhaust fan, trash compactor, garbage disposal and air conditioning.

<u>Number of Bedrooms</u>	<u>Family Size</u>	<u>Maximum Annual Income</u>	<u>Rent per Month</u>
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LOW RENT UNITS: 10% of Units (Rent Supplement Program)

Efficiency	1 (or 2)	\$3,900	\$ 75
Two Bedroom	3 (or 4)	5,000	100
Three Bedroom	5 (or 6)	6,400	115
Four Bedroom	7 +	6,400	125

MODERATE RENT UNITS: 30% of Units (Section 236 Regular Program)

Efficiency	1 (or 2)	\$5,265	\$106
Two Bedroom	3 (or 4)	6,750	140
Three Bedroom	5 (or 6)	8,640	167
Four Bedroom	7 +	8,640	178

MIDDLE RENT UNITS: 50% of Units (Section 236 Exception Program)

Efficiency	1 (or 2)	\$5,850	\$115
One Bedroom	1 (or 2)	7,110	141
Two Bedroom	3 (or 4)	8,370	166
Three Bedroom	5 (or 6)	9,630	190

UPPER RENT UNITS: 10% of Units (Market Rate)

Efficiency	1 (or 2)	--	\$177
One Bedroom	2 (or 3)	--	213
Two Bedroom	3 (or 4)	--	246
Three Bedroom	5 (or 6)	--	287

*Projected rent schedule as of September, 1971 subject to HUD modification.

UNITED STATES DEPARTMENT OF AGRICULTURE OFFICE OF THE SECRETARY

The following table shows the results of the survey of the production of the various crops in the United States for the year 1917, as compared with the production of the same crops in the year 1916.

Year	1916	1917
Total	100	100

CEREALS AND GRAIN

Product	1916	1917
Wheat	100	100
Barley	100	100
Oats	100	100
Rye	100	100
Millet	100	100
Buckwheat	100	100
Other	100	100

LEGUMES AND PULSES

Product	1916	1917
Beans	100	100
Peas	100	100
Lentils	100	100
Other	100	100

OILSEEDS

Product	1916	1917
Soybeans	100	100
Other	100	100

OTHER CROPS

Product	1916	1917
Apples	100	100
Oranges	100	100
Other	100	100

On both the east and west sites most of the basic preparatory work has been completed. Rough grading is completed and the major utility lines, including water, gas, sewer, and electricity, have been installed underground including a utility tunnel required on the east site. Work on electrical and telephone distribution systems -- all to be underground -- are now underway. The development program is entering the phase when the above-ground building construction will be most evident. Because of the emphasis on component and/or modular elements, erection will now proceed more rapidly than would conventional construction.

Rouse-Wates, Inc., is actively at work on the east site as is evidenced prominently by the unique building crane which will be used to place the pre-cast concrete elements of this system. Foundations for all these buildings are well underway and will be completed by the end of the year. Reinforced concrete sheer walls for the twelve story building are being poured as well as for the six story building. Pre-cast concrete elements are arriving and being stockpiled on the site. Erection of these pre-cast elements is scheduled to start before the end of September.

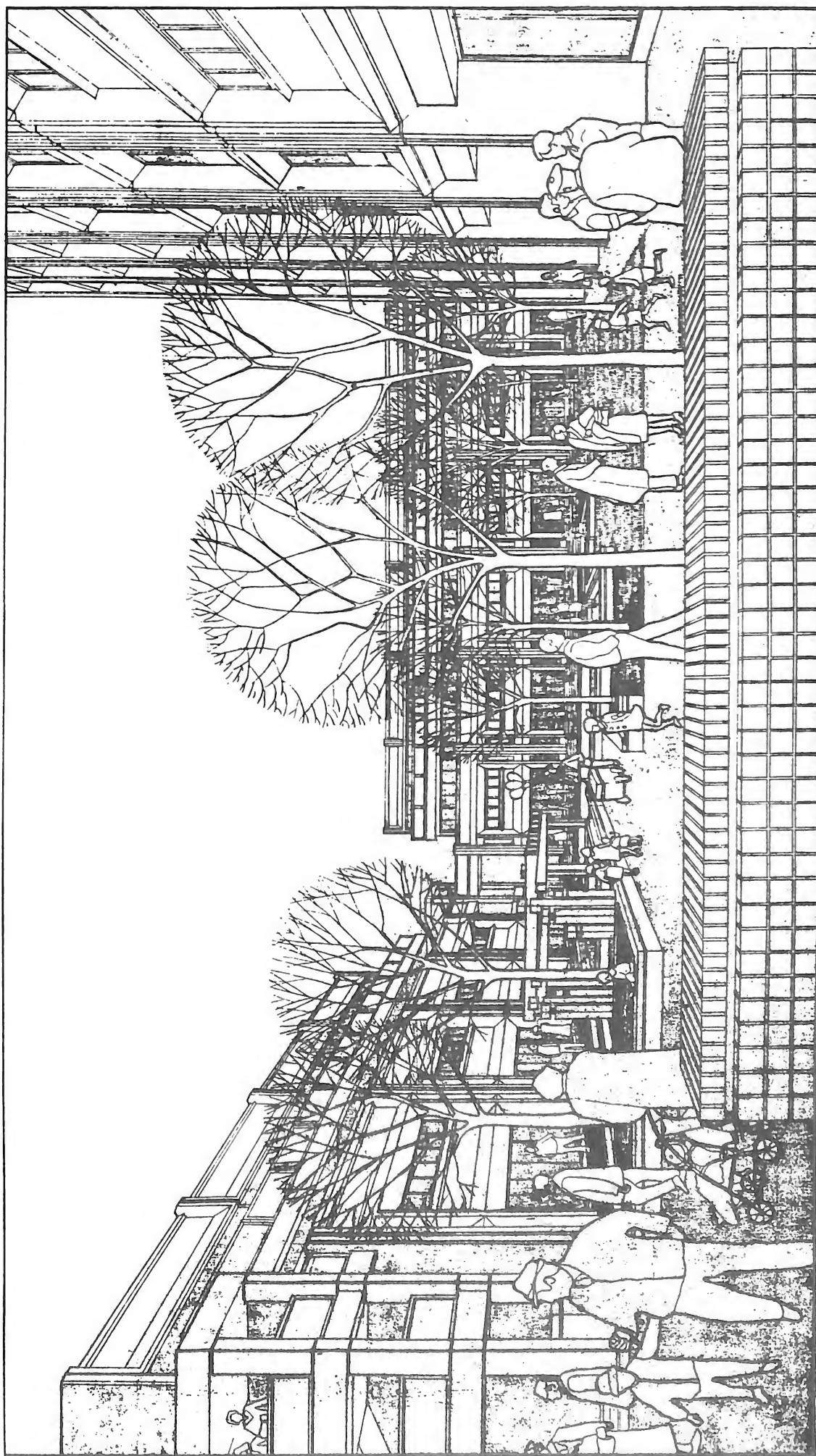
The Home Building Corporation is now completing the foundations for all of their town house units. The first modular units are now being erected on-site and all of their 75 homes will be finished in the spring.

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Rouse-Wates, Inc., housing grouped around pedestrian courtyard.

The Material Systems Corporation is scheduled to commence foundation constructions in October, 1971. The first modular units will arrive on-site early in the spring and the first units will be completed in April, 1972.

Descon-Concordia has one of the most innovative -- but at the same time most complex -- modular systems. For this reason, these homes will be the last to be completed on the site. Foundation work will be initiated this fall and pre-cast erection is scheduled to start before the first of the year. These units are scheduled for completion in the summer of 1972.

The Operation Breakthrough program includes a full complement of facilities designed to serve the residents. These are financed as part of the basic mortgage and allowance for them is included in the rents. These include a swimming pool, bath house, and maintenance building on each site and construction of these elements will begin in October, 1971.

Also included in the mortgage is a small neighborhood center to be built at the southwest corner of Lawton Place and Ewing Avenue. This center will include a multi-purpose room, meeting rooms, a small kitchen, and is designed to allow a future day care center. A portion of the space in this building will serve as an Operation Breakthrough visitor-information center during the demonstration phase. Construction is scheduled to begin in October, 1971, and to be completed before spring.

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Replacement Playfields Adjacent to Breakthrough

The Plan Commission is pleased to report that HUD has approved an application for assistance under the federal "Open Space" program to construct replacement playfields in the neighborhood.

This space is adjacent to but not within the west site of Operation Breakthrough. This public playfield space, totaling five acres, is part of the overall Mill Creek Valley Renewal and will be available to the entire community. It will replace an existing public playfield across the street known as Vashon Playfield which is being purchased by the Board of Education for future improvements and expansion to Harris Teachers College, an important City institution.

Although the new playfields do not add much new space, they will provide a much improved facility for the neighborhood because of a more convenient location, improved design, new construction, and night lighting for one of the playfields.

Note that these public playfields are in addition to the generous amounts of usable open space -- almost three acres -- which are included within and financed as part of the Operation Breakthrough developments themselves.

THEORY OF THE EARTH

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Equal Opportunity

From the outset of Operation Breakthrough, a key objective of the Department of Housing and Urban Development was to insure equal opportunity in all phases of the program and in November, 1970, they issued "Operation Breakthrough: Manpower, Employment, Training and Entrepreneur Guidelines." These were designed to give direction to prototype site developers and housing system producers on the utilization of minority and locally-owned business concerns and on manpower employment and manpower training of minorities.

The St. Louis Operation Breakthrough experiment is proceeding in full accord with not only the letter but the spirit of these guidelines.

The St. Louis Council on Human Relations -- charged with enforcement of the City's equal opportunity ordinance -- reports the full cooperation of the developer in responding fully to current regulations.

The national director of Operation Breakthrough for the Department of Housing and Urban Development, Mr. Alfred Perry, has commended the local operation, "The prototype site developer, Millstone Construction Co., Inc., and Millstone Assoc., Inc., has taken a leading role in the construction of the St. Louis site and has provided a positive example for the other prototype sites throughout the country. St. Louis' site

leads all others in the employment of minorities on their staff, workmen on the construction site, and minority entrepreneurship contractors. Millstone actively pursued Operation Breakthrough equal opportunity goals and is now participating in the fair housing aspect of their tenant selection."

Efforts will continue to not only maintain but improve upon the current record of accomplishment in the area of equal opportunity.

Operation Breakthrough in Other Cities

A variety of housing types, unit sizes, and income levels will be demonstrated at the St. Louis Operation Breakthrough sites. However, because of the constraints of the site, and the surrounding urban pattern, some types of units and building configurations were not appropriate for demonstration in St. Louis.

Across the country, the experimental sites vary in size from 1.7 acres to 60 acres and plans are designed to give each site a population density consistent with its size and in harmony with the character of its neighborhood and the needs of its occupants. At the same time, the site plans provide a variety of housing types suitable for various income levels. The number of homes per site, therefore, varies from 80 to about 500.

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Most sites are demonstrating from three to six different prototype construction systems. Ground has been broken on all sites and, although St. Louis is ahead of all but one other city in overall progress, work is now proceeding at all locations. HUD will monitor each prototype development for some time to determine the reactions of residents to the homes and to judge the overall desirability and durability of the units.

In addition to the 464 units to be built in St. Louis, approximately 300 units will be built in Indianapolis, Indiana; 300 in Macon, Georgia; 80 units in Seattle, Washington; 175 units in King County, Washington; 225 units in Kalamazoo, Michigan; 460 units in Memphis, Tennessee; 400 units in Sacramento, California; and 500 units in Jersey City, New Jersey. This totals approximately 2,900 prototype housing units throughout the country.

Sites in Seattle Washington and Jersey City, New Jersey are quite small and very urban in character, resulting in plans for multi-story apartment units with ingeniously developed open spaces. In contrast, suburban sites in Macon, Georgia, King County, Washington and Sacramento, California are low density programs including detached

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single family units developed around large open spaces or lakes.

Medium density sites such as in St. Louis and Memphis, Tennessee utilize well-defined and intensely developed open spaces in a combination of medium and low rise construction.

In this manner, HUD has been able to achieve the desired variety and, at the same time, plan Operation Breakthrough Developments consistent with surrounding community elements.

It has been reported that the first modular units have been set in place in Kalamazoo, Michigan; however, St. Louis is now on an accelerating schedule and will be among the first to have units ready for occupancy. The building methods in Kalamazoo are of a much simpler variety than those being used in St. Louis.

The East-West Gateway Coordinating Council and the St. Louis City Plan Commission are working in cooperation to develop a file of information on all of the prototype construction systems for the benefit of any potential local developers.

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Assessment

Both locally and nation-wide Operation Breakthrough has moved out of the planning phase into on-site construction. While the national schedule has not moved as rapidly as originally hoped, the St. Louis experiment is one of the most advanced and has been praised by Federal officials. Congress reduced research funds and the number of cities with Operation Breakthrough experiments was reduced from eleven down to nine (Houston and Wilmington were dropped). The National Bureau of Standards is requiring housing producers to submit detailed technical information and samples for rigid testing in more detail than the producers had anticipated. Despite such difficulties it seems clear that the national effort has stimulated progress in the building industry. Lending institutions, unions, state and local legislatures, builders and professional designers are all examining the implications of Breakthrough techniques in a desire to help solve the nation's housing problems.

At the time of this progress report, Operation Breakthrough is not sufficiently advanced for judgments to be made of any of the experimental prototype construction systems. Over the next year, local citizens and officials will have an opportunity to view and inspect the new homes and make their own judgments as to merit of the respective systems.

Detailed cost analysis will allow projections as to the cost of the units if placed in full scale production. It is too early to tell if any significant reductions can be attained in construction cost or timing.

Nevertheless, significant benefits are apparent. St. Louis has received favorable national publicity as one of the nine locations in the United States where Operation Breakthrough prototypes are being constructed. Already over 600 visitors have toured the site and, as model units are opened, a vast acceleration of visitors is anticipated. Visitors will be attracted from throughout the United States with obvious advantage to the convention and visitor industry. The addition of 464 dwelling units with complete neighborhood facilities is in itself an important addition to the housing stock of the City of St. Louis. This development will substantially complete the Mill Creek Valley reconstruction as one of the most attractive central city urban areas in the country.

The Municipal Business Development Commission has contacted each of the housing system producers and is encouraging them to locate manufacturing plants in the St. Louis area.

There is a great deal of interest in the study of the human mind, and it is a subject which has attracted the attention of many of the most distinguished philosophers and scientists of all ages.

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It is the seat of all our thoughts, feelings, and actions, and it is the source of all our knowledge and wisdom. It is the most precious part of our inheritance, and it is the one which we must take the greatest care to preserve.

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The Department of Housing and Urban Development is not guaranteeing any housing producer that its housing system will be a commercial success. Each system must be proven in the market place on its own merits, including attractiveness, cost, delivery time, and all other factors that lead buyers to select one product over another. However, HUD has selected only housing systems it considers to be of high quality design, from firms and groups of firms with proven financial, production, managerial, architectural and planning capabilities. These combinations should produce success in the market place.

The activities of HUD are focused mainly on those new factors which must be faced when a housing producer seeks a steady and sustained market for the large volume of housing he can produce. In order to gain information on the nature of the housing market, marketing studies are being prepared under local contract to HUD for major metropolitan areas throughout the country. Locally, East-West Gateway Coordinating Council has been awarded the contract for a local market aggregation study. This effort is searching out potential developers who would be interested in using Operation Breakthrough prototypes in their home building operations in this region of the country. All types of

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sites and ranges of density are suitable for consideration. Since the prototype systems are closely related to the established building codes, it does not appear that any undue difficulty will be encountered in adapting to local codes. This study also includes efforts to attract new financing and sponsoring establishments and to develop new financing techniques.

Summing up, the St. Louis Operation Breakthrough experiment is well underway. Regardless of the final assessment, it appears as an experiment well worth undertaking. The addition of new homes for all citizens of all income groups is a key priority for the City of St. Louis. The City Plan Commission has established the goal of 45,000 new homes within a decade as part of its recently published "Housing Program for the City of St. Louis" April 1971. If Operation Breakthrough, either directly or indirectly, can make a contribution to the attainment of these goals, it deserves the continuing support of all elements of the community.

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U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

OPERATION BREAKTHROUGH

The Nation faces a great housing shortage. Congress has said we need 26 million more housing units, new or rehabilitated, by 1978, if we are to meet our longtime policy of "a decent home and suitable living environment for every American family." Our rate of production has been falling far short, and drastically new approaches were vitally necessary.

Operation Breakthrough is that approach. It is a new major research and demonstration program of the U.S. Department of Housing and Urban Development aimed at improving the production of housing—bringing into the industry the modern approaches in technology, design, land use, materials, marketing, financing, and overall management, in quality housing for people of all income levels.

HUD Secretary George Romney introduced the Operation Breakthrough program in May 1969, and it is now at midpoint. HUD has received and evaluated nearly 1,100 proposals to implement the program, and has negotiated contracts totalling about \$30 million, with 22 housing system producers, 11 site planners, eight site developers, and 11 related research organizations, as well as with the National Academies of Science and Engineering (NASE) and the National Bureau of Standards (NBS).

The program is now in its prototype construction phase. Groundbreakings have been held at all nine sites situated across the country to provide a geographic distribution, as well as a varying set of urban and economic situations to provide for maximum opportunity to demonstrate the possibilities of the housing systems selected.

Shortages of skilled labor and materials have sent housing costs soaring beyond the means of millions of Americans, and Breakthrough aims at developing a supplemental productive capacity, based on new sources of labor skills, materials, improved land use, advanced management techniques, and new financial resources.

Twenty-five percent of Breakthrough systems will utilize wood construction, while 75 percent utilize concrete, metal, and even plastic construction (almost exactly the reverse of current usage of materials). But in whatever material selected, advanced methods of industrialized production will be used to achieve sustained levels of volume production.

The program, as Research and Technology in its broadest sense, attempts to show that government can be a catalyst to stimulate an industry to new directions and to greater effort in solving a critical national need, all without compounding existing problems.

Approximately 2,900 prototype housing units will be built.* Planners, including some of the most prestigious in the Nation, were given a free hand in deciding

what type of housing should be constructed on each site. It is noteworthy that all planners utilized a mix of housing types to enrich the interplay of various building forms as well as encourage a harmonious mix of social and economic groups. The plans they developed may well become models for best land use in residential areas throughout the country.

BREAKTHROUGH SITES	*APPROX. NO. OF UNITS
Indianapolis, Ind.	300
Macon, Ga.	300
St. Louis, Mo.	460
Seattle, Wash.	80
King County, Wash.	175
Kalamazoo, Mich.	225
Memphis, Tenn.	460
Sacramento, Calif.	400
Jersey City, N. J.	500

Local zoning authorities will now have a standard by which to evaluate innovative plans submitted in their communities. The prototype housing units selected include single family attached and detached, and low and high rise multifamily housing units, with the mix on each site varying according to the setting.

Financing of Breakthrough housing on six of the sites is through the Federal Home Loan Bank Board and local consortia of Savings and Loan Associations. The other sites are being financed through state finance authorities.

Breakthrough units will be "assisted" as well as free market units, utilizing HUD's programs for homeowner-ship and rental assistance, rent supplements, and Turn-key public housing.

Occupancy arrangements vary from single family (private ownership) to condominium and cooperative, with regular rental multifamily projects.

Following the testing and demonstration period at each site, the housing will begin to be occupied in late 1971. They will be placed on the market for rental or sale, without restriction.

HUD's goal as carried out in the planning of the developments, will lead to a mixture of social and economic groups. Multifamily projects will be sold to approved sponsors for permanent management, and single family units will be sold to the occupants, and HUD expects that the cost of the prototype units

may exceed conventional construction costs because of initial prototype "startup" expenses, and the research and development involved. Nevertheless, units will be sold at market value based on FHA appraisals. The

excess costs will be absorbed by HUD under its Research and Technology budget.

Aside from the immediate achievements of the program such as providing 2,900 units of housing, and the yield of important research and data, Breakthrough is expected to provide the following additional, valuable benefits:

Market Aggregation. Breakthrough early recognized the major constraints to volume production over broad markets. Diverse building codes, restrictive labor practices, outdated land use, and obsolete zoning patterns—all hindered potential of wide markets. All of this had made investments in plants relatively unattractive to the financial community.

Using a systems approach Breakthrough has tried to deal with all aspects of housing problems at one time. A major effort has been made to end the fragmentation of the market place by "aggregating" or "pooling" the market through assembly of appropriate housing sites—the definition of local housing needs, and the bringing together of viable sponsors.

State, Local Benefits. All 50 State governments (and many local governments) now have assigned personnel responsible for aggregation of Breakthrough markets, and the development of positive state programs for housing. Before Breakthrough only few states and cities had such agencies.

The great competition for Breakthrough sites, (216 proposals), was another evidence of local communities seeking innovative concepts to meet their housing needs.

State Housing Laws. Recognizing the building constraints pointed up by Breakthrough, six states have already enacted statewide industrialized housing laws, and four others have gone beyond these standards. Many other states have similar legislation in preparation although not all states have enacted such laws. Those that have moved in this direction are among the most populous in the Nation, and the ones with the greatest housing shortages.

Industrial Response. The overwhelming response from industry to HUD's invitation for proposals accelerated a trend—the formation of consortia of firms with a broad range of capabilities in housing. Beyond the 22 winners, many groups which were not chosen have nevertheless stayed together. This trend shows great promise for future housing production.

Labor. Landmark agreements have been reached with labor to permit the opportunities for greater industrialization of jobs and skills to be brought to housing.

Testing and Evaluation. Professional and academic institutions and associations as important as the NASE, NBS, and other government and private laboratories

have become part of the Breakthrough effort. The Nation's finest scientific talent has been brought to bear on the testing and evaluation of new concepts for housing.

Performance Criteria. As a direct output of the collaboration of the NASE and NBS in the Breakthrough program, for the first time there has been assembled a complete set of performance criteria for the testing and evaluation of housing. This is an effort expected by most experts to take another seven to 10 years to develop. Previously, even advanced codes emphasized specifications related to particular materials and uses. The new criteria, in effect, become "a manual of good use," from which new materials and techniques can be realistically evaluated, and which provide working tools for revising obsolete codes. The criteria are not codes in themselves but scientific means of evaluation upon which local codes can be based.

Quality Control. Breakthrough introduced a new emphasis on quality assurance in housing construction—step-by-step control and testing, and if necessary, redesign to meet top quality standards. It is expected that Breakthrough systems will be certified by HUD both as to soundness of architecture and engineering concepts as well as the quality of actual fabrication.

Equal Opportunity. Breakthrough has gone beyond the statutes and Executive orders to insure equal opportunity in its contracts in the program.

Accounting. Another product of Breakthrough includes the "marriage" of factory accounting and site construction accounting to give birth to a new cost accounting system for industrialized housing construction. No such program was found satisfactory heretofore. It is a major achievement in the area of housing production cost control.

Growth in Research. Prior to Breakthrough, research in housing was generally neglected in our economy, in part because previous efforts could show only minor immediate benefits. Because of the Breakthrough program, which is action and result-oriented, the 1970 budget was increased to \$25 million, and the 1971 budget will be \$45 million.

And, finally, for the first time since World War II, HUD is acting as a developer, experiencing all the frustrations of the field—meanwhile learning much about the problems from the standpoint of the private sector of the industry. The whole of HUD should benefit from this experience.

The outlook has never been brighter than the problems which have been holding back the promise of homes for all Americans are nearer to workable solutions.

